of evolution, but we cannot think of him as failing to appreciate the manifoldness and the subtlety of nurtural influences, both on the individual and on the race.

Prof. Pearson gives us in his masterly appreciation a useful tonic. " The laws of evolution are open to our study, let us once understand them, and man can elevate man as he has developed his domestic animals —such was the gospel of Galton." Here we are all agreed, Galton was a great man of science and also a social reformer; and it is a satisfaction to all men of goodwill that he continues to live with such vigour in the Laboratory which he founded. The appreciation has as its frontispiece a beautiful sketch of Sir Francis Galton in 1910, in his " still unexhausted exuberant youth."

Modern Dietetics.

Vitamins and the Choice of Food. By Violet G. Plimmer and Prof. R. H. A. Plimmer. Pp. xii + 164. (London · Longmans, Green and Co., 1922.) 7*s.* 6*d.* net.

THE old view that a diet was satisfactory, provided that it contained a certain amount of protein and had a sufficient calorie value, has, as is now well known, been modified in two very essential particulars. The quality of the protein is of the first importance; it must supply the particular amino-acids required by the consumer, and must supply them in the proper amount. Further, there must be present the vitamins, the exact nature and function of which are still unknown, but which are essential for growth and health.

It is to these two aspects of the subject that the present work is chiefly devoted, the authors having set themselves the task of producing an account suitable for the general reader. In this they have been on the whole successful, although occasionally the superabundance of facts renders the matter difficult of assimilation. After an introduction dealing with the general principles of dietetics, the subject of the vitamins and their discovery is developed on orthodox lines. The important question of quality of protein, led up to and illustrated by an account of pellagra, is then treated, and the book concludes with two very interesting chapters on the effect of partial deficiencies in the food and errors in selection of food. In an appendix are given a table of distribution of the vitamins in food-stuffs and lists of food-stuffs rich in each of the three vitamins, followed by a very useful series of notes on food-stuffs, from which a good idea of the efficiency of a diet can be easily and rapidly obtained. The book is well produced and contains a number of interesting illustrations.

It is an inevitable consequence of the rapid progress which is being made in this branch of dietetics that the position with respect to some of the matters dealt with has changed considerably since the book was printed. This is notably the case with regard to rickets, the very recent work of McCollum and of Korenchevsky on experimental rickets in rats, and the remarkable discovery of the preventive and healing effect of sunlight on this disease, having come too late for inclusion. Similarly, the large part played by atmospheric oxidation in the inactivation of the antiscorbutic vitamin is not made clear.

The gospel preached by the authors is the orthodox one that safety is to be found in fresh natural food-stuffs, and it is wisely pointed out that instinct, often believed to be a guide to the choice of food, is no longer so under the conditions of modern civilisation. White bread, for example, almost universally preferred in this country, is far inferior in vitaminic potency to whole-meal or " germ " bread, and no instinctive need is felt for green vegetables and salads. The choice of food must be guided by knowledge, and it is pointed out that the distribution of food within the family is often conducted on quite erroneous principles.

> " Children are supposed to be sufficiently nourished if they have bread and jam and plenty of puddings with little meat or butter. It is unfortunately the custom to give to the father or wage-earner the best food, whereas his requirements for heavy manual work are actually better satisfied by the high energy value of bread, jam, and margarine. The child needs the wherewithal to grow, that is protein and vitamins in addition to calories."

It is in the provision of fresh vegetables to supplement the staple diet of bread, margarine, and meat, all very poor in vitamins, that the chief value of the allotment movement lies (as pointed out by Drummond), and it is to be hoped that the great extension of this system which was called forth by the necessities of the war will be maintained and still further increased in the scarcely less strenuous times of peace.

Even natural food-stuffs, however, are by no means constant in their content of vitamins. Little is known as yet of the cause of the variations in vegetable products at different periods of growth and under diverse conditions, but that wide variations occur has been definitely proved. In products derived from animals this variation is still more marked, and the authors rightly lay stress on this fact, pointing out that the potency of materials such as animal fats, and above all milk, depends upon the diet of the animal from which it is derived.

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"The milk of cows at grass contains more A-factor than the milk of the same cows on their winter food. . . . At certain times of the year a child receiving fresh whole cow's milk may for this reason only be getting a small amount of this vitamin. . . . Breast-feeding is no protection against rickets if the mother's food is poor in A-factor."

The provision of fresh natural food-stuffs, although greatly to be desired, is a matter of much difficulty, especially in large towns, and is often impossible when military expeditions or explorations in barren regions have to be undertaken. Then the problem of preserving food-stuffs without destruction of their vitamins becomes of great interest and importance. The chief methods for the prolonged preservation of food are canning or bottling and drying, and a considerable amount of investigation has already been directed to the question how far these methods of treatment affect the vitamins. Up to the present, however, sufficient attention has not been paid to the influence of oxidation in these processes. The results so far obtained vary very much with the nature of the material employed. Thus vegetables on drying, as a rule, undergo a considerable loss of antiscorbutic power, that of cabbage being reduced by drying in the air at 37° to about 5-10 per cent. of the value of the fresh material. (The authors are not quite clear on this point, the somewhat misleading statement being made that "cabbage has been successfully dried by a special process devised by Holst and Fröhlich.") Retention of antiscorbutic power by material in the dry state seems to depend on the complete absence of moisture.

Heat sterilisation as applied in bottling and canning processes affects the antiscorbutic more than the other two vitamins, but the influence of oxidation is very great. However, it has been found in practice that a material originally rich in the vitamin, like the tomato, will withstand the commercial process and yield a powerfully active product, canned tomatoes having been successfully used for the prevention of scurvy. Again, lemon-juice in presence of the natural oil of the rind retains its potency for long periods. There seems, indeed, to the writer, to be no insuperable difficulty in the way of the provision of preserved foods containing at all events a large proportion of their original vitaminic potency. Much further investigation on this subject, on strictly quantitative lines, is, however, required, and at present each case must be separately examined, no generalisation being as yet justified. It is, moreover, not beyond the bounds of probability that some method will before long be found of enriching cheap edible oils so that they may supply vitamin A as well as energy at a reasonable cost.

Interesting problems are suggested by almost every page of this book, and it cannot fail to be of great value in disseminating sound doctrine on a subject concerning which there is now widespread ignorance.

Germany and English Chemical Industry.

Englands Handelskrieg und die chemische Industrie. Von Prof. Dr. A. Hesse und Prof. Dr. H. Grossmann. Band 1. Pp. iv+304. Band 2: Neue Folge. *England, Frankreich, Amerika.* Pp. iv+344. Band 3: *Dokumente über die Kali-, Stickstoff- und Superphosphat-Industrie.* Herausgegeben von A. Hesse, H. Grossmann, und W. A. Roth. Pp. iv+204. (Stuttgart: F. Enke, 1915–1919.) 98 marks.

THIS work consists of a series of translations of lectures, speeches, and articles by English, French, American, Russian, and Italian chemists, and by certain publicists like Lord Moulton, and by public bodies as the British Science Guild, which appeared at the outbreak of the Great War, or immediately prior to it. In addition, a number of utterances by public men and others, of more or less importance, have been culled from newspapers and the periodical press to support what is the apparent purpose of the publication, namely, to insinuate that the real motive which impelled England to participate in the war was her distrust and jealousy of Germany's industrial pre-eminence, especially in the chemical arts, and her consciousness that she was losing the world's markets owing to Germany's greater technical skill and scientific knowledge, and her better business organisation and financial methods. This idea is implied in the title of the work. It has been sedulously propagated in Germany that the real author of the war was England, and that it was solely to her diplomacy that the catastrophe was brought about—an explanation, and it may be added an exculpation, which doubtless commends itself to the soul of the Teuton.

There is, of course, no necessity to refute an implication which is notoriously at variance with the facts, and is certainly not held by ordinarily well-informed people, even in Germany. But it is characteristic of German mentality that it should have been seriously entertained even in 1915, when the first volume of this work was issued, and that persons of the position of its editors should have been found to support it.

The translations of the English lectures and addresses, most of which have appeared in the recognised journals dealing with applied chemistry, seem to have been well rendered, although exception may occasionally be taken to the comments and explanatory notes which the editors have appended. But it is more

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